



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL CENTER FOR ENVIRONMENTAL RESEARCH
WASHINGTON, DC 20460

OFFICE OF
RESEARCH AND DEVELOPMENT

August 2, 2006

TO: Marie Lynn Miranda, Associate Research Professor, Duke University
and Director, Children's Environmental Health Initiative

FROM: Nigel Fields, US EPA Project Officer

SUBJECT: Potential STAR Center grant —Southern Center on
Environmentally-Driven Disparities in Birth Outcomes (SCEDDBO)

Congratulations,

I am pleased to inform you that EPA's Office of Research and Development, National Center for Environmental Research (NCER) will be making a recommendation to the EPA Grants Administration Division (GAD) to fund your research proposal through our STAR Program. This is not an official notification of the award; only the Agency's Grants Administration Division can make the formal award and announcement. The purpose of this email is to request additional information regarding your proposal.

As your project officer, I will be preparing the necessary paperwork to process the funding request. In order to complete the funding package, I will need the information below from you as soon as possible. Anything you do not submit electronically, or anything that requires original signatures, needs to be sent via FedEx. EPA is still experiencing delays of up to a month with our regular mail system due to security checks and irradiation of mail.

Questions: First, I need to have you answer a few questions in order to update your proposal. Please e-mail your response to me. Do you anticipate any of the following situations associated with this grant award:

- 1) Any changes to your proposal, i.e., are personnel moving to other universities and such?
- 2) Any foreign travel?
- 3) Any federal employees on your grant?
- 4) Conducting workshops?
- 5) Human and/or animal subjects?
- 6) Development of questionnaires/and or surveys?

Grants Administration Division Number:

Your application will be assigned GAD number upon receipt of a sf424 application, and key contacts sheet (attached). Once assigned, please use this number on any correspondence you send to me, or anyone at EPA, as it makes it easier for us to locate your file. This is the number you will use as the grant/project number on forms you will need to complete, as well as on your annual and final reports, abstracts, etc.

Abstract:

Please update/revise your abstract using the format contained in the attached file "NCER STAR GRANT ABSTRACT.doc" and send it to me electronically as a Word Perfect or Word file. Your abstract will be posted at <http://es.epa.gov/ncer/grants/>.

NOTE: Please pay special attention to the "Expected Results" section. The Government Performance and Results Act (GPRA) requires all EPA programs, including grants, to show results that ultimately improve responsible parties' ability to protect the environment and public health. A clear, concise description of how this research will accomplish this will help EPA explain why this project should be funded. *When discussing results and benefits to potential clients, note that the funding mechanism for all awards issued under STAR solicitations consist of assistance agreements from EPA; therefore, the primary purpose of a grant is to accomplish a public purpose of support or stimulation authorized by federal statute, rather than acquisition for the direct benefit or use of the Agency.* However, the EPA will monitor research progress through annual reports provided by grantees and other contacts, including site visits, with the Principal Investigator.

Interaction(s) Between ORD Researchers and EPA Grant and Cooperative Agreement Applicants/Recipients

In issuing a grant agreement, EPA anticipates that there will be no substantial EPA involvement in the design, implementation, or conduct of the research. EPA/ORD does, however, encourage scientific interaction between its researchers and individuals conducting research funded under the auspices of the National Center for Environmental Research (NCER) Science To Achieve Results (STAR) program and other grant programs, ORD laboratories/Centers/Offices (L/C/O), other offices of EPA, and non-EPA organizations, and grant Principal Investigators after the award of an EPA grant for the sole purpose of exchanging information in research areas of common interest that may add value to their respective research activities. This interaction must be incidental to achieving the goals of the research under a grant. Interaction that is incidental does not involve resource commitments. Such interactions promote better science and enhance the integration of intramural and extramural research activities. However, these interactions must be in compliance with existing statutes, regulations, and policies of the Federal Government. See attached for guidance.

QA Plan:

In addition to the Quality Assurance Statement provided in your proposal, we may also need more detailed quality assurance (QA) documentation in accordance with EPA's Quality System policy (see <http://epa.gov/quality/exmural.html> for more information). Generally, more detail will be needed if your project involves the collection or use of environmental data (including the use of data compiled from other sources such as databases or the literature), environmental monitoring, or the collection or use of data supporting the design, testing, and operation of environmental technology. In this case, a special term and condition may be added to the grant at the time of award detailing this additional QA documentation. Typically, this documentation is submitted to EPA with 90 days of award of the grant.

For STAR grants, the following forms of QA documentation may be required:

- Quality Assurance Statement (QAS): EPA may request that you provide additional details in your Quality Assurance Statement.
- Quality Management Project Plan (QMPP): EPA may request that you develop a QMPP in accordance with QA/G-1STAR (<http://es.epa.gov/ncer/guidance/glstarqadfinal.pdf>). A QMPP is a document that includes elements of the QA Statement but contains more information and details about the planned QA and QC activities. It is a combination of the Quality Management Plan and QA Project Plan described below.
- Quality Management Plan (QMP): In a few cases (for example, for Research Centers), EPA may request that you develop a QMP. A QMP documents how an organization plans, implements, and assesses the effectiveness of its quality assurance and quality control operations, in particular, how an organization structures its quality system, the quality policies and procedures, areas of application, and roles, responsibilities, and authorities. For more information on QMPs, see <http://epa.gov/quality/qmps.html>.
- Quality Assurance (QA) Project Plan: In some rare cases, EPA may request that you develop a QA Project Plan. A QA Project Plan is a document that describes the planning, implementation, and assessment procedures for a particular project, as well as any specific QA and QC activities. For more information on QA Project Plans, see <http://epa.gov/quality/qapps.html>.

The QA documentation identified in the Terms and Conditions of the final award package may be submitted electronically and should contain the signature of your QA Officer along with his/her contact information.

Budget:

If I have asked that you revise your budget, please send a **revised copy of the budget(s) - total and subs** - along with a justification sheet reflecting any changes. Also, please complete a new Form 424 (attached) to reflect new budget totals and any changes we have discussed. If you did not need to revise your budget but a yearly break down was not included as part of your proposal, **please send information on the total budget as well as separate itemized budgets for each year**. Note: I will need the original Form 424 with original signatures so please FedEx this form.

Foreign Travel:

EPA's Office of International Affairs must approve any foreign travel related to the grant well in advance of the travel date. To obtain this approval, I will need for you to submit a justification for the trip that includes the purpose, estimated budget, travel destination, agenda (if possible), abstract (if you presenting a paper), cost estimate, and the Fly America justification; (for example, for all foreign travel the recipient must comply with the Fly America Act. All travel must be on U.S. air carriers certificated under 49 U.S.C. Section 1371, to the extent that service by such carriers is available even if foreign air carrier costs are less than the American air carrier).

Miscellaneous Forms:

The "Certification Regarding Lobbying" and "Assurances - Non-Construction" Forms need to be completed and FedEx'ed to me (with the original signatures). These forms are attached in MS Word format or available on our website at <http://es.epa.gov/ncer/rfa/forms/>.

Human Subjects:

It will be necessary to determine if the work being performed under this grant award:

- o Involves Human Subjects (as defined by 40 CFR 26 Section 102(f))
- o Is considered research (as defined by 40 CFR Section 102(d))
- o Does involve Human Subjects, is deemed research, yet under the common rule

but maybe exempt. Please provide documentation and/or evidence of, though not necessarily by the IRB, this decision of exemption. It will be necessary for EPA to also agree that the work is exempt.

- o Does involve Human Subjects, is research and is not exempt, then no human subjects may be involved in this project(s), *including recruitment*, until it has been reviewed and approved by EPA's Human Subjects Research Review Official (HSRRO).

Please submit the following documents (if applicable):

Proof of the Institution's Human Subjects Institutional Review Board (IRB) - Federal Wide Assurance Number/FWA #.

A copy of the IRB approved protocol and copy of your Institutional Review Board (IRB) approval for the study described in the proposal.

A copy(ies) of the IRB approved Informed Consent Form(s) that you intend to use during the study and/or questionnaires. Approval must be made by the IRB of the Institution that proposes to conduct the work. Written evidence of any approvals made by the IRB in accordance with the Common Rule and copies of all documents used by the Institution's IRB for review and approval; including, protocol, detailed discussions of the proposed research, and written evidence of the IRB approved informed consent.

Grants Administration's approval of dollars:

No work can start or resources spent involving Human Subjects (*note that human subjects includes recruitment*), unless there is approval by the Institution's IRB and the EPA's Human Subjects Research Review Official (HSRRO); OR under certain circumstances, EPA can issue a conditional approval pending final determination as per 40 CFR 26.118.

It is also important to note that although not specifically required by EPA, once the grant is underway, the PI submit to the EPA Project Officer annually, written evidence that the IRB has reviewed and approved the ongoing research.

Animal Subjects:

The Recipient agrees to comply with the Animal Welfare Act of 1966 (P.L. 89-544), as amended, 7 USC 2131-2156. Recipient also agrees to abide by the "U.S. Government Principles for the Utilization and Care of Vertebrate Animals used in Testing, Research, and Training." (Federal Register 50(97): 20864-20865. May 20, 1985). The nine principles can be viewed at: <http://www.nal.usda.gov/awic/pubs/IACUC/vert.htm>. For additional information about the Principles, the recipient should consult the Guide for Care and Use of Laboratory Animals, prepared by the Institute of Laboratory Animal Resources, National Research Council and can be accessed at: <http://www.nap.edu/readingroom/books/labrats/>.

Reporting Requirements:

Upon receipt of your grant award, you will need to send annual reports within 90 days of the anniversary of your start date. (If you request a no-cost extension, an annual report for the year of your extension will be required). A more extensive final report is due within 90 days of the end of your project period. Guidance on these reports are contained the attached files; please save these files for future reference. More information on these reports will be provided, but it is important to be aware of this requirement before a final funding decision is made.

After you have received official funding, the work must be attributed as sponsored (or co-sponsored as applicable) by the STAR program in writings or discussions about your EPA Science to Achieve Results (STAR) research. EPA's full or partial support must be acknowledged in journal articles, oral or poster presentations, news releases, interviews with reporters and other communications. Any documents developed under the agreement for distribution to the public or inclusion in a scientific, technical, or other journal shall include the following statement: This publication [article] was developed under a STAR Research Assistance Agreement No. _____ awarded by the U.S. Environmental Protection Agency. It has not been formally reviewed by the EPA. The views expressed in this document are solely those of [name of recipient] and the EPA does not endorse any products or commercial services mentioned in this publication. A graphic that can be converted to a slide or used in other ways, such as on a poster, is located at http://es.epa.gov/ncer/guidance/star_images.html. EPA expects recipients to use this graphic in oral and poster presentations.

It is also important to the STAR program that you provide us with a list of any major awards that you receive for your research during your tenure as a STAR grantee. Examples of awards include best paper, best author, or any award of national or international significance. Acknowledging the significant awards to our grantees often helps us demonstrate the quality of our program to the many audiences that review our research results. In the future, we may ask you to tell us about any research results conducted under STAR that are particularly noteworthy as well.

I am looking forward to hearing from you soon. As mentioned above, most information should be sent as e-mail attachments but the final hard copies with original signatures will need to be Fed Ex'ed to me at the address below. If you have any questions regarding this memo or the STAR Program, please do not hesitate to contact me.

Kind Regards,

Nigel Fields
Environmental Health Scientist
US EPA, National Center for Environmental Research
Washington DC
202.343.9767
fields.nigel@epa.gov

FEDEX/ Courier Address only:

Nigel Fields
US EPA, Woodies Building
1025 F Street, NW (Rm 3107-C)
Washington, DC 20004

4/25/2007

OMB Approval No. 0343 0044

BUDGET INFORMATION — Non-Construction Programs

SECTION A — BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Duke - R833293		\$ 7,735,637	\$	\$ 7,735,637	\$	\$ 7,735,637
2.						0
3.						0
4.						0
5. TOTALS		\$ 7,735,637	\$	\$	\$	\$ 7,735,637

SECTION B — BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
a. Personnel	(b) (4)				\$
b. Fringe Benefits					\$
c. Travel					\$
d. Equipment					\$
e. Supplies					\$
f. Contractual					\$
g. Construction					\$
h. Other					\$
i. Total Direct Charges (sum of 6a - 6h)					\$
j. Indirect Charges					\$
k. TOTALS (sum of 6i and 6j)	\$ 7,735,637	\$	\$ 7,735,637	\$	\$
7. Program Income	\$	\$	\$	\$	\$

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Standard Form 424A# (4-88)
Prescribed by OMB Circular A-102

SECTION C — NON-FEDERAL RESOURCES				
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8.	\$	\$	\$	\$
9.				
10.				
11.				
12. TOTALS (sum of lines 8 and 11)	\$	\$	\$	\$

SECTION D — FORECASTED CASH NEEDS					
	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$	\$	\$	\$	\$
14. NonFederal					
15. TOTAL (sum of lines 13 and 14)	\$	\$	\$	\$	\$

SECTION E — BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT				
(a) Grant Program	FUTURE FUNDING PERIODS (Years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16.	\$	\$	\$	\$
17.				
18.				
19.				
20. TOTALS (sum of lines 16 - 19)	\$	\$	\$	\$

SECTION F — OTHER BUDGET INFORMATION (Attach additional Sheets if Necessary)	
21. Direct Charges:	22. Indirect Charges:
23. Remarks	

BUDGET INFORMATION — Non-Construction Programs

SECTION A — BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Duke - R833293		\$	\$	\$ 7,735,637	\$	\$ 7,735,637
2.						0
3.						0
4.						0
5. TOTALS		\$	\$	\$	\$	\$ 7,735,637

SECTION B — BUDGET CATEGORIES


6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
a. Personnel	\$	\$	(b) (4)	\$	\$
b. Fringe Benefits					
c. Travel					
d. Equipment					
e. Supplies					
f. Contractual					
g. Construction					
h. Other					
i. Total Direct Charges (sum of 6a - 6h)					
j. Indirect Charges					
k. TOTALS (sum of 6i and 6j)	\$	\$	\$ 7,735,637	\$	\$
7. Program Income	\$	\$	\$	\$	\$

SECTION C — NON-FEDERAL RESOURCES				
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8. <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
9. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
10. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
11. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
12. TOTALS (sum of lines 8 and 11)	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>

SECTION D — FORECASTED CASH NEEDS					
	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
14. NonFederal	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
15. TOTAL (sum of lines 13 and 14)	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>

SECTION E — BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT				
(a) Grant Program	FUTURE FUNDING PERIODS (Years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16. <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
17. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
18. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
19. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
20. TOTALS (sum of lines 16 - 19)	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>

SECTION F — OTHER BUDGET INFORMATION (Attach additional Sheets if Necessary)	
21. Direct Charges: <input type="text"/>	22. Indirect Charges: <input type="text"/>
23. Remarks <input type="text"/>	

	U.S. ENVIRONMENTAL PROTECTION AGENCY Grant Agreement		GRANT NUMBER (FAIN): 83329301		DATE OF AWARD 04/25/2007		
			MODIFICATION NUMBER: 0				
			PROGRAM CODE: RD		TYPE OF ACTION New		MAILING DATE 05/02/2007
			PAYMENT METHOD: ACH		ACH# 2011		
RECIPIENT TYPE: Private University			Send Payment Request to: Las Vegas Finance Center				
RECIPIENT: Duke University P.O. BOX 90077 Durham, NC 27708-0077 EIN: 56-0532129			PAYEE: Director, ORS Duke University P.O. Box 90077 Durham, NC 27708-0077				
PROJECT MANAGER Marie Miranda LSRC A133, Box 90326 Durham, NC 27708 E-Mail: mmiranda@duke.edu Phone: 919-613-8023		EPA PROJECT OFFICER Nigel Fields 1200 Pennsylvania Ave, NW, 8723F Washington, DC 20460 E-Mail: fields.nigel@epa.gov Phone: 202-343-9767		EPA GRANT SPECIALIST Joselynn Hawkins OGD, 3903R E-Mail: Phone: 202-564-5305			
PROJECT TITLE AND DESCRIPTION FDP - Southern Center on Environmentally-Driven Disparities In Birth Outcomes - The objective of the Southern Center on Environmentally-Driven Disparities in Birth Outcomes (SCEDDBO) is to determine how environmental, social, and host factors jointly drive health disparities and birth outcomes. The Center will support the following three highly integrated studies: (1) a geographic information system based, statistics project; (2) a community-based birth cohort; and (3) a basic science animal model.							
BUDGET PERIOD 12/01/2006 - 11/30/2011		PROJECT PERIOD 12/01/2006 - 11/30/2011		TOTAL BUDGET PERIOD COST \$7,735,637.00	TOTAL PROJECT PERIOD COST \$7,735,637.00		

NOTICE OF AWARD

Based on your Application dated 08/09/2006 including all modifications and amendments, the United States acting by and through the US Environmental Protection Agency (EPA) hereby awards \$3,094,908. EPA agrees to cost-share 100.00% of all approved budget period costs incurred, up to and not exceeding total federal funding of \$3,094,908. Recipient's signature is not required on this agreement. The recipient demonstrates its commitment to carry out this award by either: 1) drawing down funds within 21 days after the EPA award or amendment mailing date; or 2) not filing a notice of disagreement with the award terms and conditions within 21 days after the EPA award or amendment mailing date. If the recipient disagrees with the terms and conditions specified in this award, the authorized representative of the recipient must furnish a notice of disagreement to the EPA Award Official within 21 days after the EPA award or amendment mailing date. In case of disagreement, and until the disagreement is resolved, the recipient should not draw down on the funds provided by this award/amendment, and any costs incurred by the recipient are at its own risk. This agreement is subject to applicable EPA statutory provisions. The applicable regulatory provisions are 40 CFR Chapter 1, Subchapter B, and all terms and conditions of this agreement and any attachments.

ISSUING OFFICE (GRANTS MANAGEMENT OFFICE)		AWARD APPROVAL OFFICE	
ORGANIZATION / ADDRESS		ORGANIZATION / ADDRESS	
Grants and Interagency Agreement Management Division 1200 Pennsylvania Ave, NW Mail code 3903R Washington, DC 20460		Environmental Protection Agency Office of Research and Development 1200 Pennsylvania Ave, NW Washington, DC 20460	
THE UNITED STATES OF AMERICA BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY			
Digital signature applied by EPA Award Official Mildred Lee - Chief - Grants Operations Branch A, 3903R			DATE 04/25/2007

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FUNDS	FORMER AWARD	THIS ACTION	AMENDED TOTAL
EPA Amount This Action	\$	\$ 3,094,908	\$ 3,094,908
EPA In-Kind Amount	\$	\$	\$ 0
Unexpended Prior Year Balance	\$	\$	\$ 0
Other Federal Funds	\$	\$	\$ 0
Recipient Contribution	\$	\$	\$ 0
State Contribution	\$	\$	\$ 0
Local Contribution	\$	\$	\$ 0
Other Contribution	\$	\$	\$ 0
Allowable Project Cost	\$ 0	\$ 3,094,908	\$ 3,094,908

Assistance Program (CFDA)	Statutory Authority	Regulatory Authority
66.509 - Science to Achieve Results (STAR) Program	Clean Air Act: Sec. 103 Clean Water Act: Sec. 104 Safe Drinking Water Act: Sec. 1442	N/A

Fiscal									
Site Name	Req No	FY	Approp. Code	Budget Organization	PRC	Object Class	Site/Project	Cost Organization	Obligation / Deobligation
-	0726TJ0347	0708	C	26T4000	404FB2D	4141	-	-	2,142,949
-	0726TJ0347	0607	C	26T40NN	405FB2D	4141	-	-	951,959
									3,094,908

Table A - Object Class Category (Non-construction)	Total Approved Allowable Budget Period Cost
1. Personnel	(b) (4)
2. Fringe Benefits	
3. Travel	
4. Equipment	
5. Supplies	
6. Contractual	
7. Construction	
8. Other	
9. Total Direct Charges	
10. Indirect Costs: % Base <u>see terms and conditions</u>	
11. Total (Share: Recipient <u>0.00</u> % Federal <u>100.00</u> %.)	
12. Total Approved Assistance Amount	\$7,735,637
13. Program Income	\$0
14. Total EPA Amount Awarded This Action	\$3,094,908
15. Total EPA Amount Awarded To Date	\$3,094,908

Administrative Conditions

Minority Business Enterprises (MBE)/Women's' Business Enterprises (WBE) Terms and Conditions for non-SRF Recipients with EPA-approved FY2006 MBE/WBE Goals that were not based on historical data of dollars awarded to MBEs and WBEs

1. The recipient agrees to comply with the requirements of EPA's Program for Utilization of Small, Minority and Women's Business Enterprises in procurement under assistance agreements:

(a) The recipient accepts the applicable FY2006 Minority Business Enterprise (MBE)/Women's' Business Enterprise (WBE) "fair share" goals/objectives negotiated with EPA by the State as the FY2006 MBE/WBE "fair share" goals/objectives as follows:

	MBE	WBE
Construction	8%	5%
Supplies	7%	9%
Services	7%	9%
Equipment	9%	9%

OR

Combined Rate: _____ % _____ %

If the recipient wishes to negotiate their own MBE/WBE goals, the recipient must submit proposed MBE/WBE goals based on an availability analysis, or, at their option, a disparity study, of qualified MBEs and WBEs to do the work in the relevant market for construction, equipment, services, and supplies. The recipient agrees to submit proposed "fair share" objectives, together with the supporting availability analysis or disparity study, to the MBE/WBE Coordinator, Veronica Squirrell, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW Mail Code 3903R, Room 51275, Washington, DC 20460, 202-564-5347, within 30 days of award. EPA will conclude "fair share" negotiations within 30 days of receiving the submission. Once EPA approves the objectives, the recipient agrees to apply them in accordance with paragraphs 1.(b)-(f).

(b)(1) The recipient agrees to ensure, to the fullest extent possible, that at least the applicable "fair share" objectives of Federal funds for prime contracts or subcontracts for supplies, construction, equipment or services are made available to organizations owned or controlled by socially and economically disadvantaged individuals, women and Historically Black Colleges and Universities.

(2) For assistance agreements related to research under the Clean Air Act Amendments of 1990, the recipient agrees to ensure, to the fullest extent possible, that at least the applicable "fair share" objectives of Federal funds for prime contracts or subcontracts for supplies, construction, equipment or services are made available to organizations owned or controlled by socially and economically disadvantaged individuals, women, disabled Americans, Historically Black Colleges and Universities, Colleges and Universities having a student body in which 40% or more of the students are Hispanic, minority institutions having a minority student body of 50% or more, and private and voluntary organizations controlled by individuals who are socially and economically disadvantaged.

(c) The recipient agrees to include in its bid documents the applicable "fair share" objectives of Federal funds and require all of its prime contractors to include in their bid documents for subcontracts the negotiated "fair share" percentages.

(d) The recipient agrees to follow the six affirmative steps or positive efforts stated in 40 CFR 30.44(b), 40 CFR 31.36(e), or 40 CFR 35.6580, as appropriate, and retain records documenting compliance.

(e) The recipient agrees to submit an EPA form 5700-52A "MBE/WBE Utilization Under Federal Grants,

Cooperative Agreements and Interagency Agreements," beginning with the Federal fiscal year quarter the recipient receives the award and continuing until the project is completed. These reports must be submitted to MBE/WBE Coordinator, Veronica Squirrell, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW Mail Code 3903R, Room 51275, Washington, DC 20460, 202-564-5347, within 30 days of the end of the Federal fiscal quarter (January 30, April 30, July 30, and October 30). For assistance awards for continuing environmental programs (40 CFR Part 35, Subpart A and B) and assistance awards with institutions of higher education, hospitals and other non-profit organizations, the recipient agrees to submit an EPA form 5700-52A to MBE/WBE Coordinator, Veronica Squirrell, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW Mail Code 3903R, Room 51275, Washington, DC 20460, 202-564-5347, by October 30 of each year.

(f) If race and /or gender neutral efforts prove inadequate to achieve a "fair share" objective, the recipient agrees to notify EPA in advance of any race and/or gender conscious action it plans to take to more closely achieve the "fair share" objective.

2. The recipient agrees, if a contract is awarded under this assistance agreement, in accordance with Section 129 of Public Law 100-590, the Small Business Administration and Reauthorization and Amendment Act of 1988, to utilize and encourage the contractor to utilize small business located in rural areas (SBRA), to the maximum extent possible, through the use of the six affirmative steps.

3. EPA may take corrective action under 40 CFR Parts 30, 31, and 35, as appropriate, if the recipient fails to comply with these terms and conditions.

2. The Director, Grants Administration Division, has approved a deviation waiving the requirements of 40 CFR Parts 30 and 40 for this project. This project will be subject to the current Federal Demonstration Project General Terms and Conditions and the EPA Agency specific terms and conditions.

3. Recipients shall fully comply with Subpart C of 40 CFR Part 32, entitled "Responsibilities of Participants Regarding Transactions." Recipient is responsible for ensuring that any lower tier covered transaction, as described in Subpart B of 40 CFR Part 32, entitled "Covered Transactions," includes a term or condition requiring compliance with Subpart C. Recipient is responsible for further requiring the inclusion of a similar term or condition in any subsequent lower tier covered transactions. Recipient acknowledges that failing to disclose the information required under 40 CFR 32.335 may result in the delay or negation of this assistance agreement, or pursuance of legal remedies, including suspension and debarment.

Recipients may access the Excluded Parties List System at <http://www.epls.gov>. This term and condition supersedes EPA Form 5700-49, "Certification Regarding Debarment, Suspension, and Other Responsibility Matters."

4. EPA is partially funding this budget period and will consider funding the balance of the budget request contingent upon satisfactory progress as certified by the EPA Project Officer, the availability of funds, and EPA priorities. It is understood that the scope of work will be renegotiated to reflect the amount awarded if additional funds are not available.

5. Payment to consultants. EPA participation in the salary rate (excluding overhead) paid to individual consultants retained by recipients or by a recipient's contractors or subcontractors shall be limited to the maximum daily rate for a Level IV of the Executive Schedule (formerly GS-18), to be adjusted annually. This limit applies to consultation services of designated individuals with specialized skills who are paid at a daily or hourly rate. As of January 1, 2007, the limit is \$557.28 per day and \$69.66 per hour. This rate does not include transportation and subsistence costs for travel performed (the recipient will pay these in accordance with their normal travel reimbursement practices).

Subagreements with firms for services which are awarded using the procurement requirements in 40 CFR 30 or 31, as applicable, are not affected by this limitation unless the terms of the contract provided the recipient with responsibility for the selection, direction, and control of the individuals who will be providing

services under the contract at an hourly or daily rate of compensation. See 40 CFR 31.36(j) or 30.27(b).

6. The recipient agrees that work shall not begin on this project until the enclosed "Preaward Compliance Review Report", EPA Form 4700-4, has been completed and returned together with the signed acceptance of this assistance agreement/amendment.

7. Indirect costs are calculated at 55.50% MTDC in Year 1 and 56.00 MTDC in Years 2 - 5.

Programmatic Conditions

1. The recipient agrees to comply with the terms and conditions outlined in Attachment 1 to this Agreement.

Office of Research Support
Duke University

Campus Box 104010
Durham, North Carolina 27708
Telephone (919) 684-3030
Fax (919) 684-2418

Suite 710 Erwin Square
2200 West Main Street
Durham, North Carolina 27705

March 7, 2008

Nigel A. Fields, M.S.P.H.
US EPA,
National Center for Environmental Research (8723F)
Washington, DC 20460

Dear Mr. Fields:

On behalf of Duke University, I am pleased to endorse the enclosed proposal submitted by Professor Marie Lynn Miranda entitled "*Southern Center on Environmentally-Driven Disparities in Birth Outcomes (Supplement)*" requesting a total budget of \$98,350.

This office acts as the University's authorized official in approving and signing off on proposals. When a proposal is submitted, and if it is funded this office acts on behalf of Duke University faculty and fellows in negotiating and administering the award, insuring responsible accounting procedures, and notifying faculty and fellows of reports required by the sponsor.

Any technical questions about this project should be addressed to Dr. Miranda. But, in order to facilitate a response to any administrative questions related to this proposal, or to process an award should you decide to make one, please send all award and administrative correspondence to this office at the following address:

Judith Dillon, Director - Office of Research Support
Duke University
Suite 710 Erwin Square
2200 West Main Street
Durham, NC 27705

Please feel free to contact me if you require any additional information about Duke University. Your consideration of this proposal is greatly appreciated.

Sincerely,

(b) (6)

Maria Scripa, CRA
Assistant Director

APPLICATION FOR FEDERAL ASSISTANCE

OMB Approval No. 0348-0043

TYPE OF SUBMISSION: Application <input type="checkbox"/> Construction <input checked="" type="checkbox"/> Non-Construction		2. DATE SUBMITTED	Applicant Identifier
		3. DATE RECEIVED BY STATE	State Application Identifier
Preapplication <input type="checkbox"/> Construction <input type="checkbox"/> Non-Construction		4. DATE RECEIVED BY FEDERAL AGENCY	Federal Identifier

5. APPLICANT INFORMATION

Legal Name: Duke University	Organizational Unit: Nicholas School of the Environment and Earth Sciences
Address (give city, county, State, and zip code): 2200 West Main Street Suite 710 Durham, NC 27705-4010	Name and telephone number of person to be contacted on matters involving this application (give area code) ADMIN: Judith B. Dillon (919) 684-3030 PI: Marie L. Miranda (919) 613-8023

6. EMPLOYER IDENTIFICATION NUMBER (EIN):

5

6

—

0

5

3

2

1

2

9

7. TYPE OF APPLICANT: (enter appropriate letter in box) J

A. State	H. Independent School Dist.
B. County	I. State Controlled Institution of Higher Learning
C. Municipal	J. Private University
D. Township	K. Indian Tribe
E. Interstate	L. Individual
F. Intermunicipal	M. Profit Organization
G. Special District	N. Other (Specify) _____

8. TYPE OF APPLICATION:
☒ New ☐ Continuation ☐ Revision
 If Revision, enter appropriate letter(s) in box(es)
 A. Increase Award B. Decrease Award C. Increase Duration
 D. Decrease Duration Other(specify): _____

9. NAME OF FEDERAL AGENCY:
 Environmental Protection Agency

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER:
—

11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT:
 Southern Center on Environmentally-Driven Disparities in Birth Outcomes (Supplement)

12. AREAS AFFECTED BY PROJECT (Cities, Counties, States, etc.):
 TITLE: _____

13. PROPOSED PROJECT <table style="width:100%;"> <tr> <td>Start Date</td> <td>Ending Date</td> </tr> <tr> <td>9/1/08</td> <td>8/31/09</td> </tr> </table>	Start Date	Ending Date	9/1/08	8/31/09	14. CONGRESSIONAL DISTRICTS OF: <table style="width:100%;"> <tr> <td>a. Applicant</td> <td>b. Project</td> </tr> <tr> <td>04</td> <td>04</td> </tr> </table>	a. Applicant	b. Project	04	04
Start Date	Ending Date								
9/1/08	8/31/09								
a. Applicant	b. Project								
04	04								

15. ESTIMATED FUNDING: <table style="width:100%;"> <tr> <td>a. Federal</td> <td>\$ 98,350⁰⁰</td> </tr> <tr> <td>b. Applicant</td> <td>\$ 0⁰⁰</td> </tr> <tr> <td>c. State</td> <td>\$ ⁰⁰</td> </tr> <tr> <td>d. Local</td> <td>\$ ⁰⁰</td> </tr> <tr> <td>e. Other</td> <td>\$ ⁰⁰</td> </tr> <tr> <td>f. Program Income</td> <td>\$ ⁰⁰</td> </tr> <tr> <td>g. TOTAL</td> <td>\$ 98,350⁰⁰</td> </tr> </table>	a. Federal	\$ 98,350 ⁰⁰	b. Applicant	\$ 0 ⁰⁰	c. State	\$ ⁰⁰	d. Local	\$ ⁰⁰	e. Other	\$ ⁰⁰	f. Program Income	\$ ⁰⁰	g. TOTAL	\$ 98,350 ⁰⁰	16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS? a. YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON: DATE _____ b. No. <input type="checkbox"/> PROGRAM IS NOT COVERED BY E. O. 12372 <input type="checkbox"/> OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW
a. Federal	\$ 98,350 ⁰⁰														
b. Applicant	\$ 0 ⁰⁰														
c. State	\$ ⁰⁰														
d. Local	\$ ⁰⁰														
e. Other	\$ ⁰⁰														
f. Program Income	\$ ⁰⁰														
g. TOTAL	\$ 98,350 ⁰⁰														

17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT?
☐ Yes If "Yes," attach an explanation. ☒ No

18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT, THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.

a. Type Name of Authorized Representative Judith B. Dillon	b. Title Director	c. Telephone Number (919) 684-3030
d. Signature of Authorized Representative		e. Date Signed

BUDGET JUSTIFICATION

Budget Justification

Postdoctoral Associate - A postdoctoral associate will work closely with Drs. Miranda and Gelfand (investigators on the SCEDDBO parent grant) on developing hierarchical space-time statistical models to explore the effects of social and environmental factors on birth weight outcomes for pregnant women. S/he will work on this project from September 1, 2008 to August 31, 2009.

Fringe and cost of living - Fringe benefits are calculated at the standard Duke rate for research staff. An annual 3% cost of living raise, which is standardly implemented at the university on July 1 of each year, is included.

Travel - Funds are requested for travel by the postdoctoral associate to attend meetings and/or seminars for presentation of research results in the amount of \$1500 for the project period.

Indirect costs - The Duke University negotiated indirect cost rate is 56% for the project period.

DUKE UNIVERSITY

Grant Application

Miranda, Marie L.

SUMMARY OF WORK

The supplemental award to the EPA Children's Center Grant, Southern Center on Environmentally-Driven Disparities in Birth Outcomes (SCEDDBO), will be used to support the development of hierarchical space-time statistical models to explore the effects of social and environmental factors on birth weight outcomes for pregnant women. Statistical models will be developed to provide a coherent framework for fusing air pollution monitoring data and Community Multi-Scale Air Quality (CMAQ) model output. CMAQ is an atmospheric simulation model that is used to predict average pollution levels for gridded cells.

The primary research objective of SCEDDBO is to determine how environmental, social, and host factors jointly contribute to health disparities in health outcomes. One of the key issues here is to develop the best assessment of exposure to environmental stressors. In this regard, based upon earlier literature as well as animal experiments, we anticipate that exposure to fine and coarse particulate matter (PM) as well as ozone can affect birth outcomes - in particular, low birthweight and pre-term births. The problem we face is to develop an accurate assessment of such exposure during the course of a woman's pregnancy.

Currently, we are linking birth certificate data to air quality monitoring data by matching maternal residential address to the nearest Air Quality System (AQS) monitor. However, the nearest site may not provide representative air quality levels at individual addresses. A preferred approach is to combine both air monitoring data and CMAQ to provide optimal predictions of air quality at specific locations. Then these high resolution predictions of air quality can be applied to the Stochastic Human Exposure and Dose Simulation (SHEDS) model to provide optimal simulated human exposures to ozone and PM. These simulated human exposures are expected to provide much better assessments of exposure - birthweight relationships. The proposed additional funding will be used to develop highly refined space-time exposure models for PM and ozone, using SHEDS modeling approaches. These models will be applied to both the population-level data and prospective cohort study data.

We have PM and ozone measurements available daily from AQS monitoring stations. First, we will fit space-time models to these datasets and then interpolate space-time surfaces to achieve daily, perhaps weekly exposure at given residence locations. A second, more sophisticated approach, will adopt a data assimilation strategy. In this regard, we have modeled PM and ozone available at very high temporal resolution over 12 km grid cells (provided by CMAQ). We will fuse the station data and the model output to learn about the true unobserved exposure surface. Again, this would be implemented over space and time, enabling space-time interpolation to residence locations. In addition to the existing more standard approaches, a third new and attractive strategy is a space-time down-scaler model. Here, the notion is that there is a relationship between the observed station data and the corresponding CMAQ model output. However, this relationship may vary in space and time. In other words, the calibration of the CMAQ data to the station data requires a rather sophisticated model. However, once we achieve space-time calibration, then we can down-scale CMAQ grid cell values in time and space, again enabling interpolation to exact residence locations.

The supplemental award to the SCEDDBO center grant will be used in direct conjunction with Projects A (spatial epidemiology) and B (clinical obstetrics), and indirectly support the work being undertaken in Project C. Through investigation of the above approaches, we expect to achieve the most reliable prediction of ambient PM and ozone exposure yet developed, as well as the uncertainty associated with these predictions. Through a hierarchical model, we will insert these predictions into the SHEDS model and propagate uncertainty through the modeling stages. Thus, we

DUKE UNIVERSITY

Grant Application

Miranda, Marie L.

will estimate individual exposures with associated uncertainty, allowing for much improved assessment of the impact of exposures on pregnancy outcomes. The new exposure estimates will be directly relevant to the analysis of pregnancy outcomes in Projects A and B and will be used to calibrate exposure levels in Project C (animal model). Thus the supplement will be highly additive and synergistic with the existing work of SCEDDBO and advance the state-of-science for predicting air quality surfaces using different sources of spatial information such as site-specific air monitoring data and gridded numerical model output.

SECTION C - NON-FEDERAL RESOURCES				
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8.	\$ 0	\$	\$	\$ 0
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	\$ 0	\$	\$	\$ 0

SECTION D - FORECASTED CASH NEEDS					
	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ 98,350	\$ 24,588	\$ 24,588	\$ 24,588	\$ 24,586
14. Non-Federal	0	0	0	0	0
15. TOTAL (sum of lines 13 and 14)	\$ 98,350	\$ 24,588	\$ 24,588	\$ 24,588	\$ 24,586

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT				
(a) Grant Program	FUTURE FUNDING PERIODS (Years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16.	\$	\$	\$	\$
17.				
18.				
19.				
20. TOTAL (sum of lines 16-19)	\$	\$	\$	\$

SECTION F - OTHER BUDGET INFORMATION	
21. Direct Charges:	22. Indirect Charges: Predetermined, Rate: 56%, MTDC, Amt. of Base: 63,045, Total IDC: 35,305
23. Remarks: See Attached	

BUDGET INFORMATION - Non-Construction Programs

OMB Approval No. 0348-0044

SECTION A - BUDGET SUMMARY						
Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1.		\$	\$	\$ 98,350	\$ 0	\$ 98,350
2.						
3.						
4.						
5. Totals		\$	\$	\$ 98,350	\$ 0	\$ 98,350

SECTION B - BUDGET CATEGORIES					
6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
a. Personnel	\$	(b) (4)	\$	\$	\$ (b) (4)
b. Fringe Benefits					
c. Travel					
d. Equipment					
e. Supplies					
f. Contractual					
g. Construction					
h. Other					
i. Total Direct Charges (sum of 6a-6h)					
j. Indirect Charges					
k. TOTALS (sum of 6i and 6j)	\$	98,350	\$	\$	\$ 98,350

7. Program Income	\$	\$	\$	\$	\$
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Standard Form 424A (Rev. 7-97)
Prescribed by OMB Circular A-102

SECTION C - NON-FEDERAL RESOURCES				
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8.	\$ 0	\$	\$	\$ 0
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	\$ 0	\$	\$	\$ 0

SECTION D - FORECASTED CASH NEEDS					
	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ 98,350	\$ 24,588	\$ 24,588	\$ 24,588	\$ 24,586
14. Non-Federal	0	0	0	0	0
15. TOTAL (sum of lines 13 and 14)	\$ 98,350	\$ 24,588	\$ 24,588	\$ 24,588	\$ 24,586

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT				
(a) Grant Program	FUTURE FUNDING PERIODS (Years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16.	\$	\$	\$	\$
17.				
18.				
19.				
20. TOTAL (sum of lines 16-19)	\$	\$	\$	\$

SECTION F - OTHER BUDGET INFORMATION	
21. Direct Charges:	22. Indirect Charges: Predetermined, Rate: 56%, MTDC, Amt. of Base: 63,045, Total IDC: 35,305
23. Remarks: See Attached	